

Experiments in Downscaled Seasonal Forecasting - The Impact of the 2002-2003 El Nino on Florida Dry Season Storminess

Bart Hagemeyer

Rebecca Almeida

**National Weather Service
Melbourne, Florida**

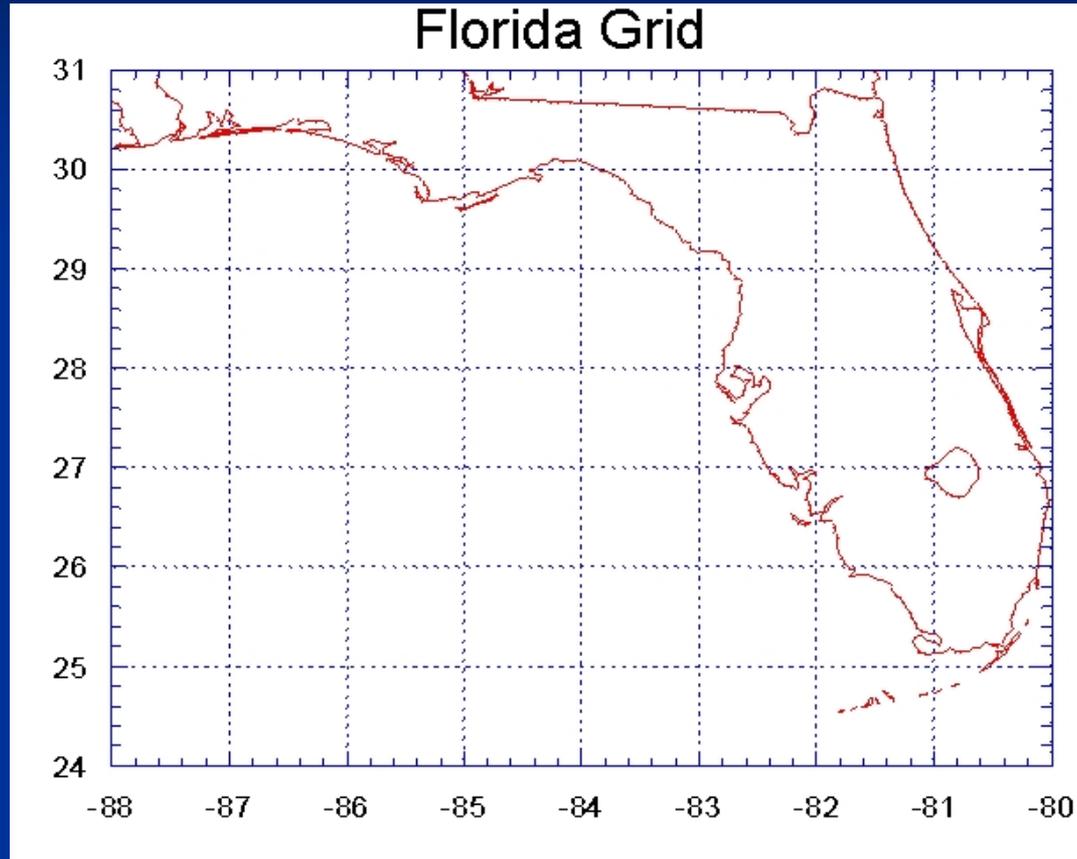


Outline

- **Brief Review of Forecast Methodology**
- **Improved Florida Dry Season Storminess Climatology**
- **MLR Expanded to all Nino Areas on all Combinations of Storm and Jet Tracks From new Climatology**
- **Review Performance During 2002-03 Moderate El Nino**
- **Outlook for 03-04**



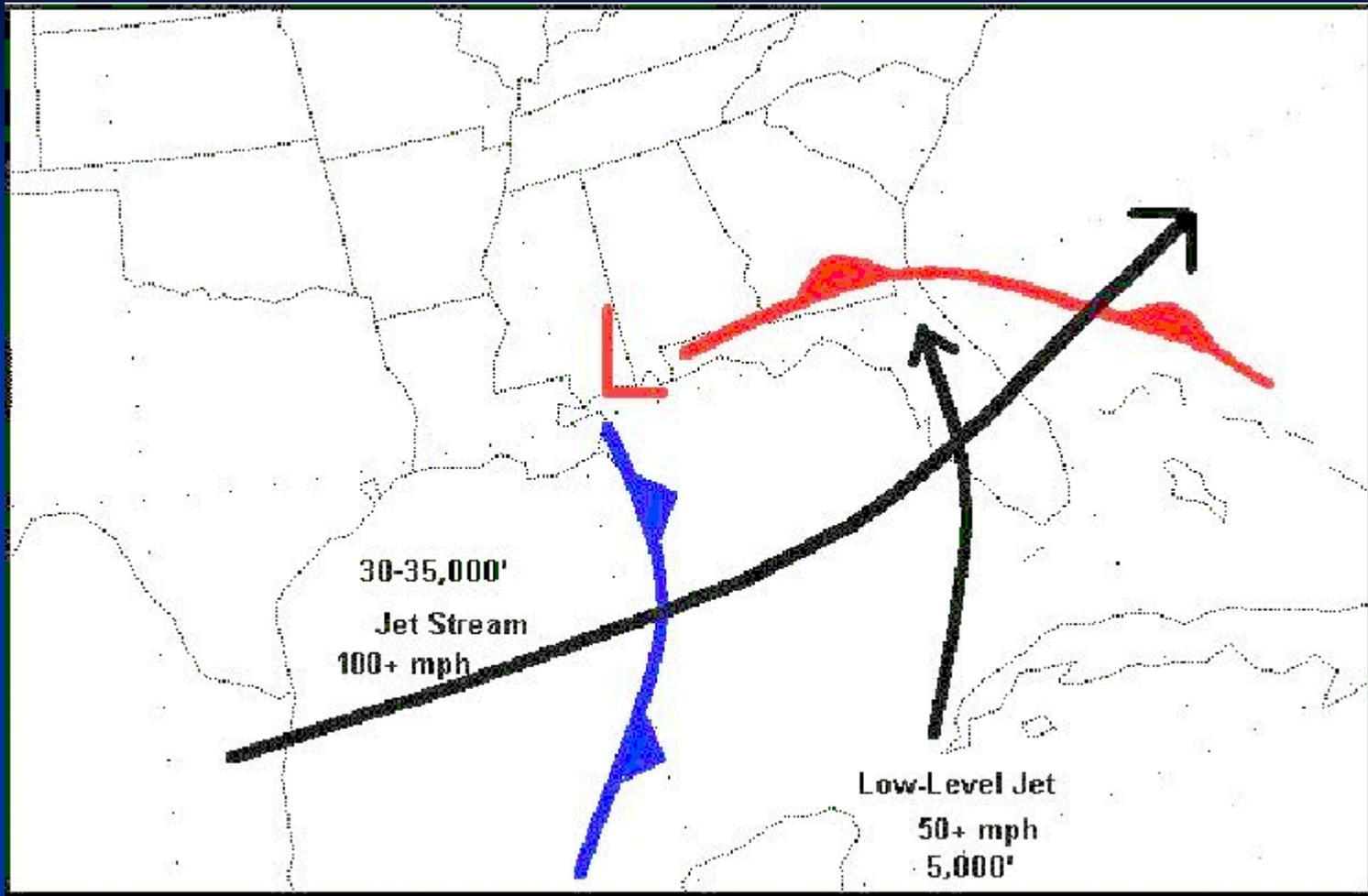
Goal: Predict Dry Season Storminess Over Florida as far in Advance as Possible Based on Observed and Predicted Pacific SST's



Seasonal Storminess - The Accumulated Passage of Significant Extratropical Cyclones

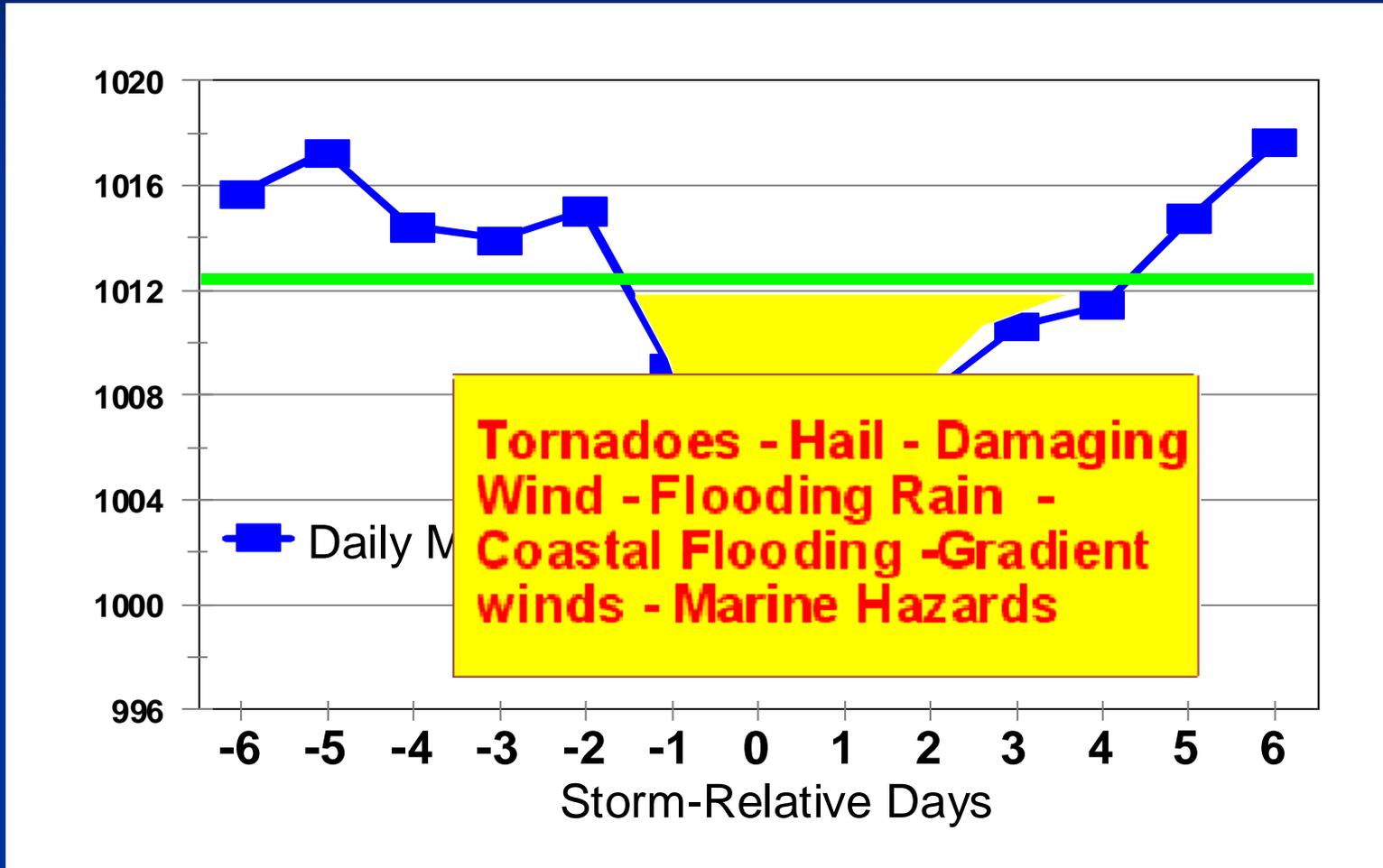


Conceptual Model of a Significant Extratropical Cyclone in the Florida Dry Season:

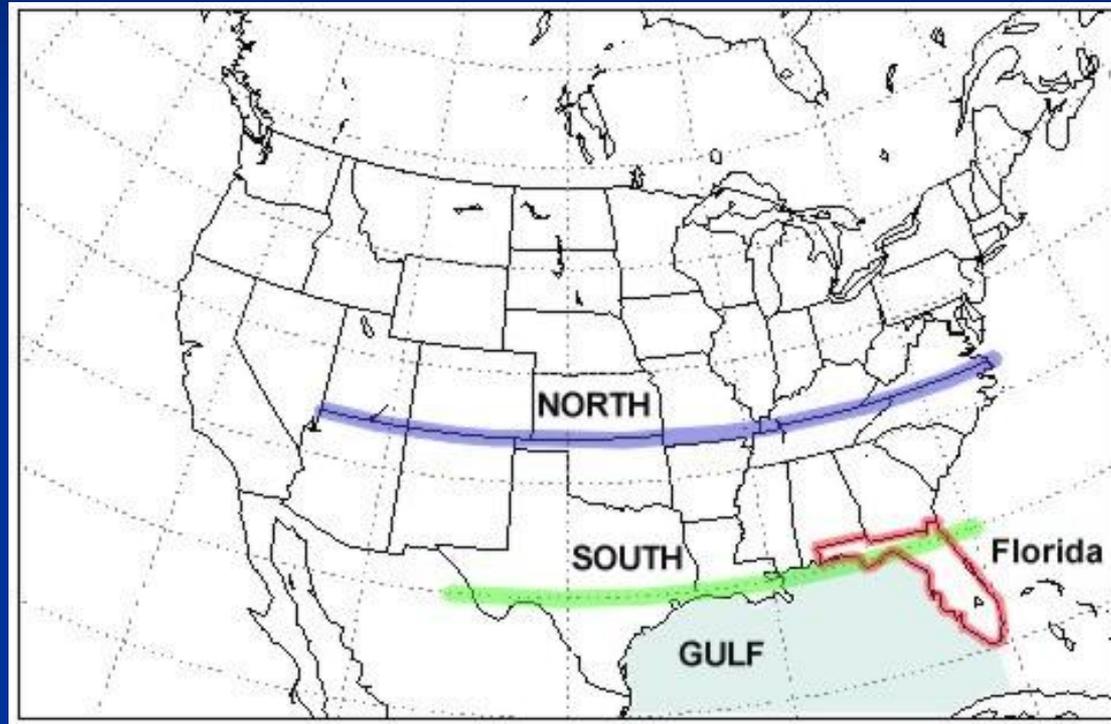


Conceptual Model of Significant Extratropical Cyclone or "Storm" Passage Through the Florida Grid -

Daily MSLP Minima ≤ 1012.5 From 1 November - 30 April



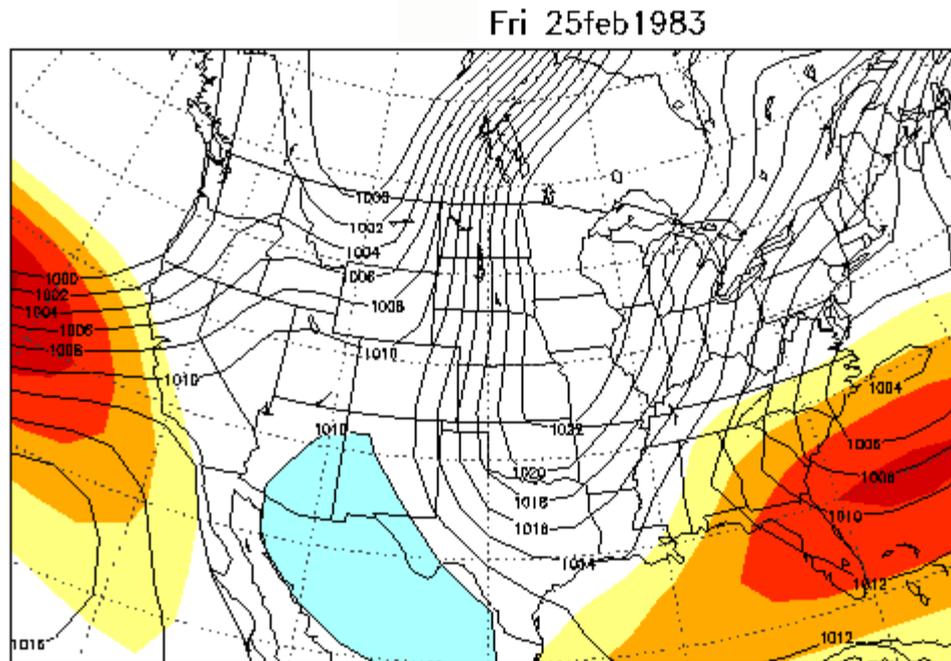
Improved Storminess Climatology



Inspection of 319 “Statistical Storms” 1960-2001 for Validity, Track, and Associated Jet Track

Loops of 250 mb wind and MSLP reviewed for all 319 Cases

Most Common Case : Gulf Cyclone – Gulf Jet

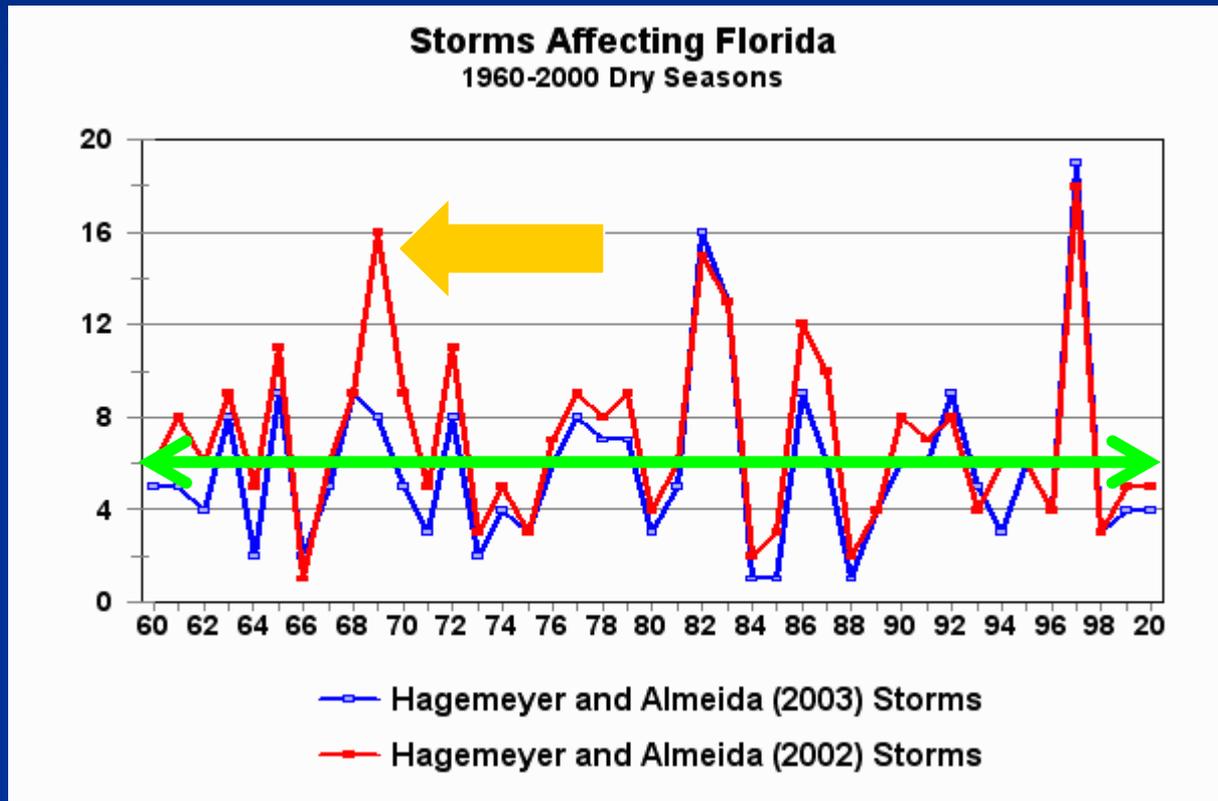


Result: More Accurate Count of Storms and Stratification by Track and Jet

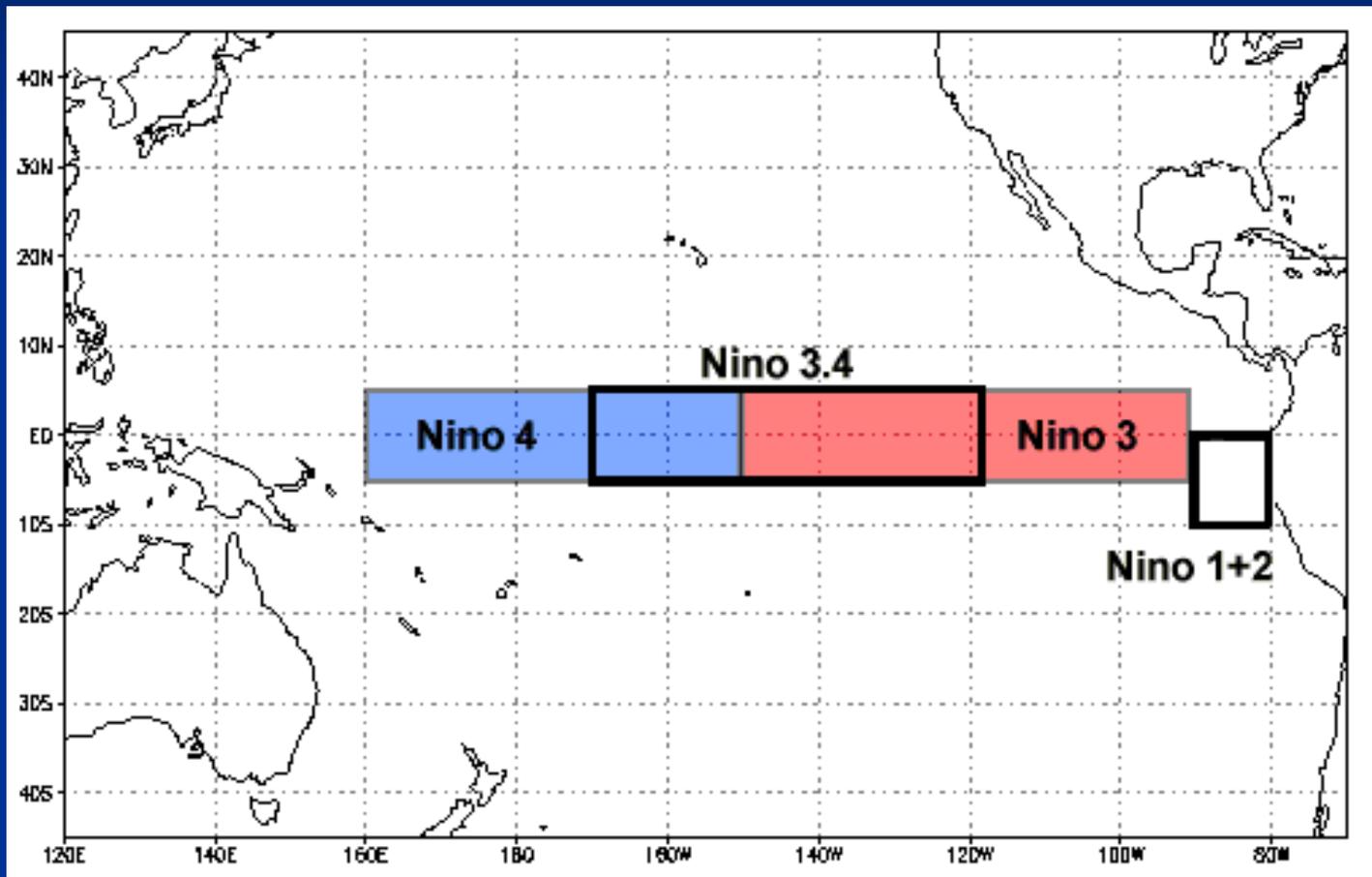
	Storm Tracks			
Jet Tracks	North	South	Gulf	Total
North	4	1	1	6
South	41	44	39	124
Gulf	24	34	49	107
Total	69	79	89	237

Table 1. Classification of the 237 Florida storms by storm track and associated jet stream track. Note that Gulf track storms and jets are a subset of southern track storms and

Some Significant Seasonal Changes from Previous Climatology (average reduced from 7 to 6)



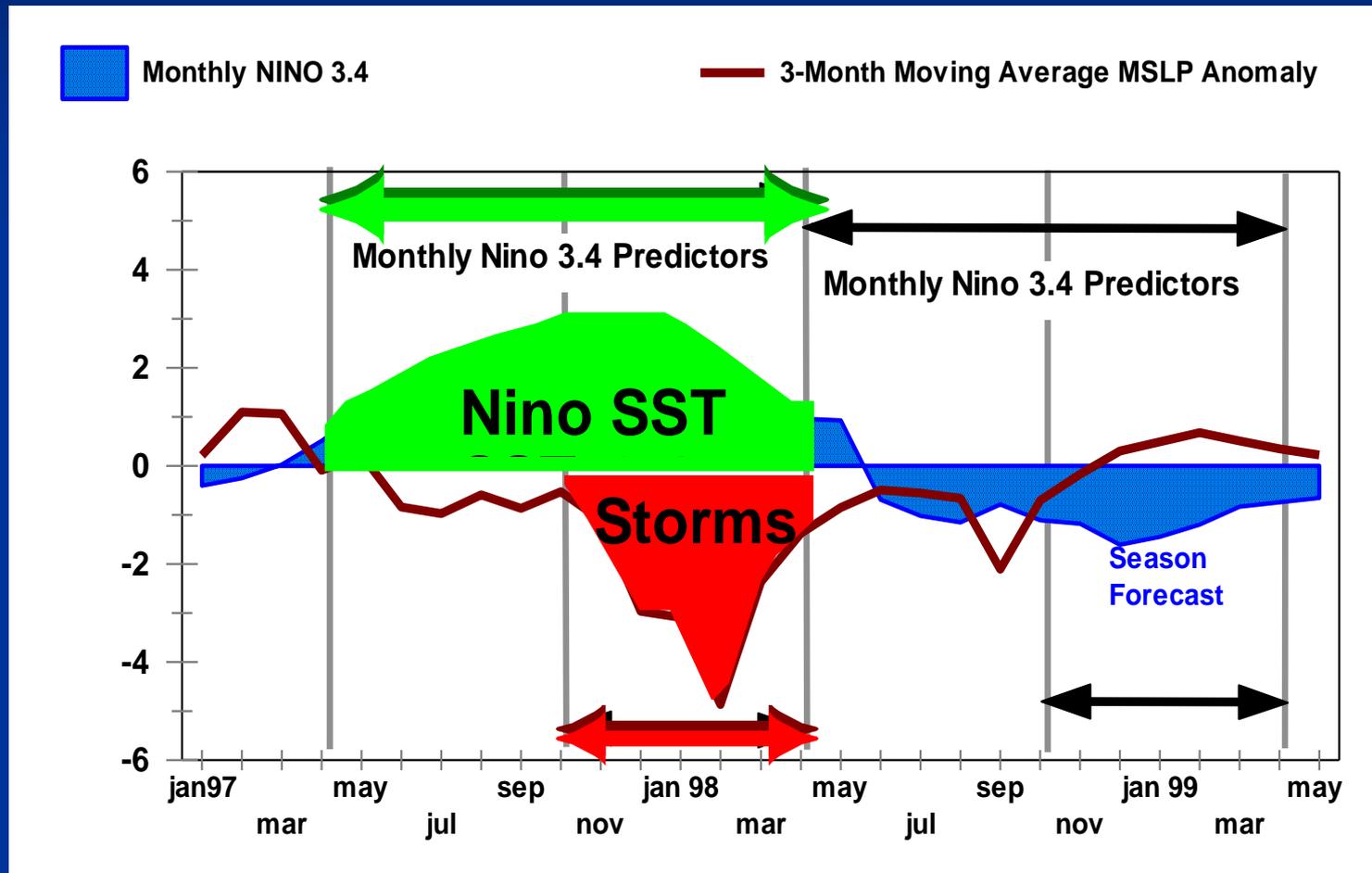
Multiple Linear Regression of New Storm Climatology on all Nino Areas (Previous Work only on Nino 3.4)



Nino 3.0 and 1+2 (East Pacific) Performed Best for Florida



Seasonal Forecast Methodology - Find Best Combination of May to April SST Predictor Variables to Predict November to April (Seasonal) Storminess Over Florida



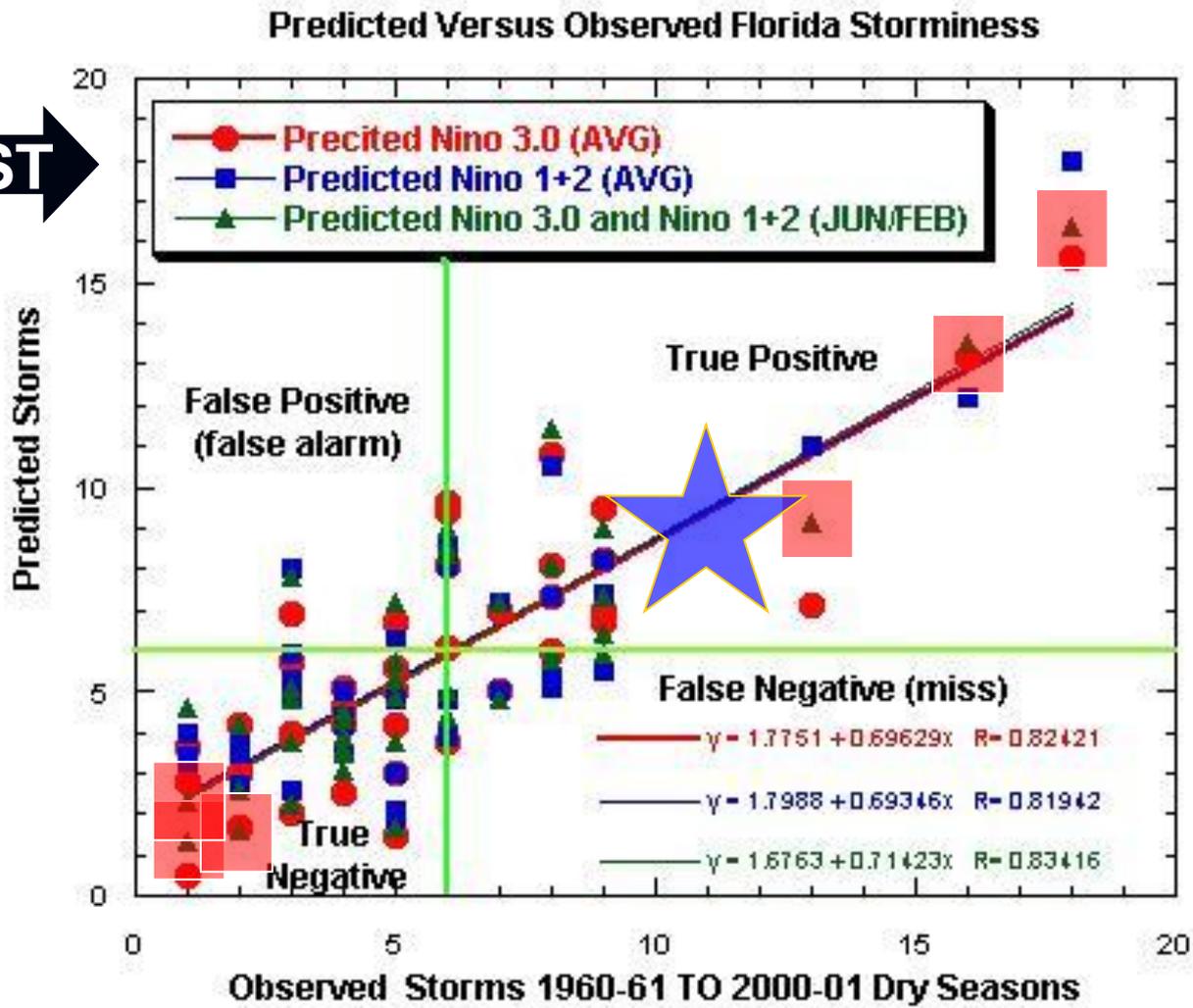
Lesson Learned: Limited to Two Variables Due to Multicollinearity

Taylor-Russell Diagram

Many predictor combinations gave similar results

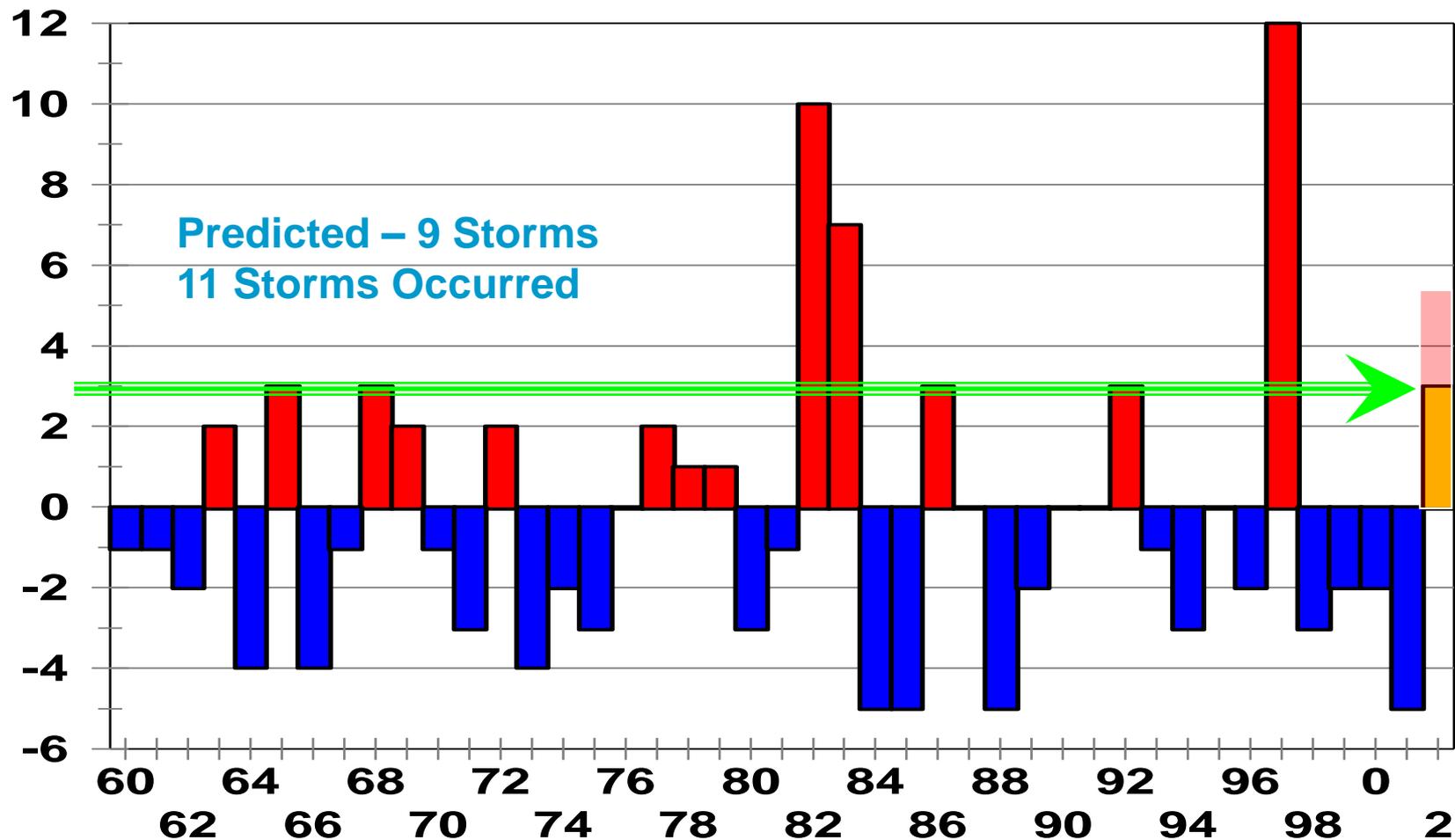
Strong relationship between ENSO and above/below normal storminess –
Especially extreme phases which have most significant impact

BEST →

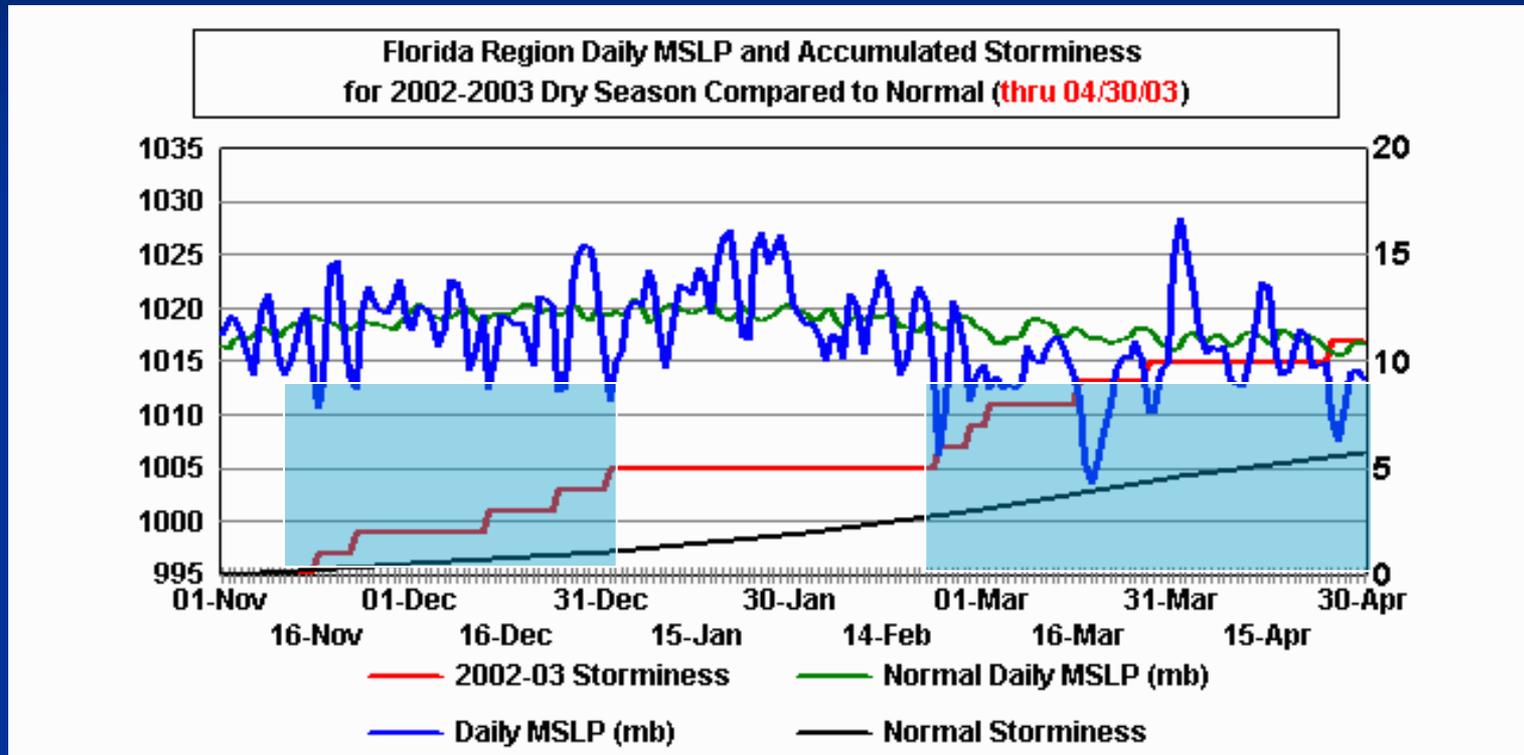


Predicted 9 Storms for 2002-03 Dry Season on 15 May 2002 -
5.5 to 11.5 months lead time

Florida Dry Season Storminess Departure from Normal (1960-2001)

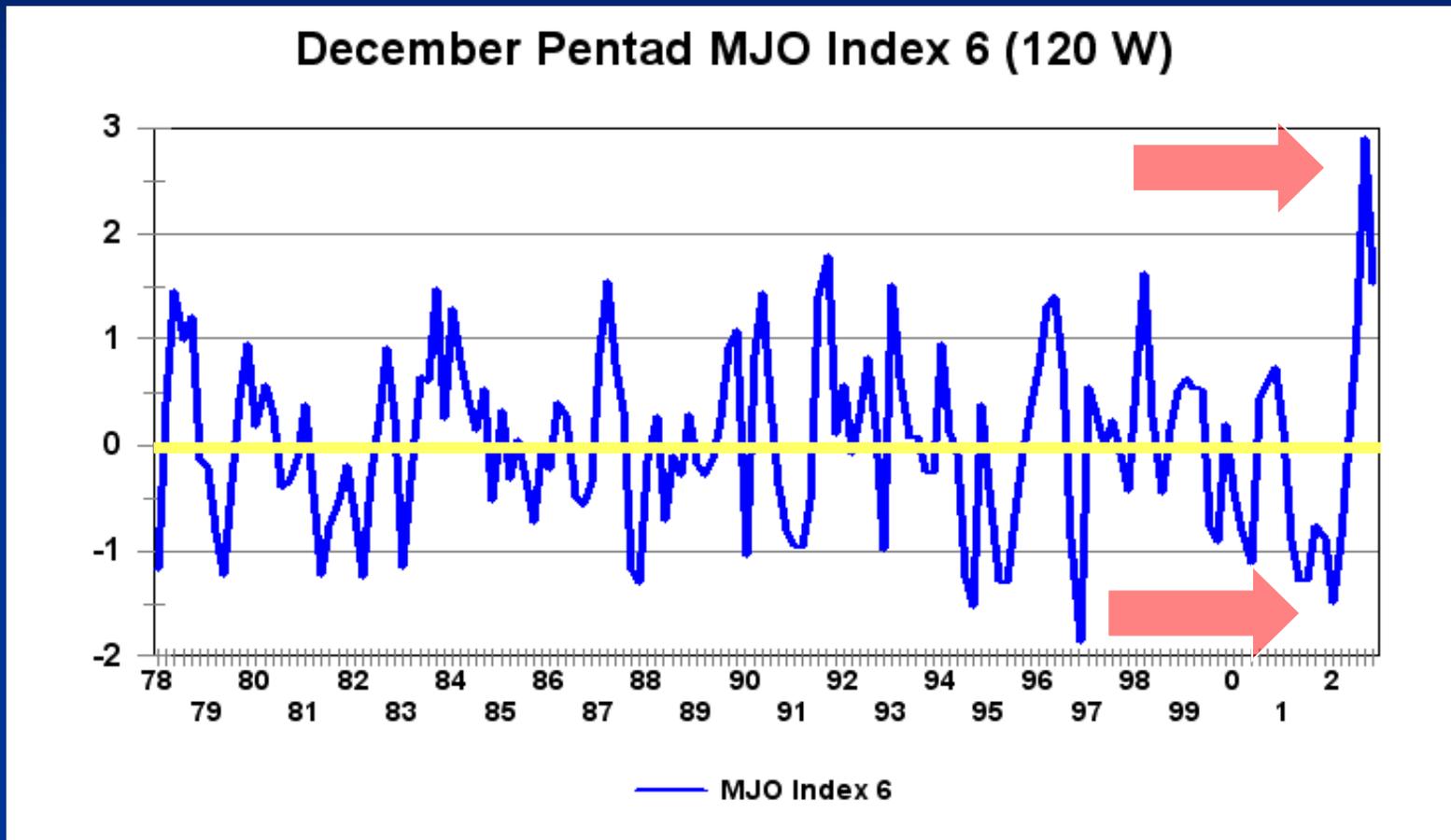


2002-03 Florida Dry Season Storminess Seasonal Forecast Was Quite Good Spatial and Temporal Intraseasonal Variability Interesting



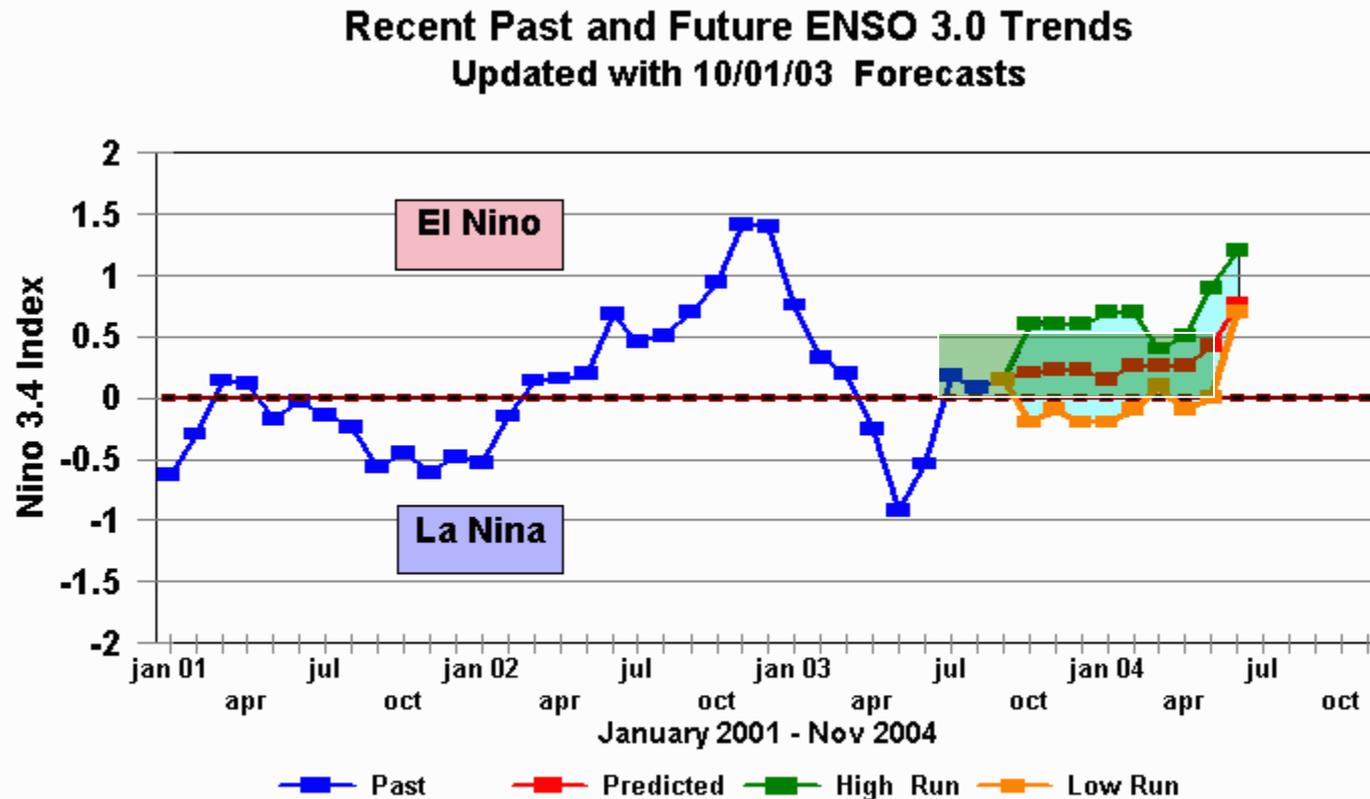
- Very Stormy and Wet Late November and December
- Extended Break in January and February (**Blocking**)
- Return to Stormy and Wet March and April

**ENSO Clearly Dominant *Seasonal* Signal –
Intraseasonal Variability Likely Modified by Other Higher
Frequency Teleconnections Such as MJO, PNA, NAO....**



PNA Also Strongly Positive in December

2003-2004 Season Observed and Forecast SST (Updated 10/1/03)





National Weather Service Forecast Office

Melbourne, FL



Site Map

News

Organization

Search All NWS search Go

- Home
- Seasonal Outlook
- El Nino Discussion
- Storminess
- Rainfall
- Temperature
- Education & Research
- Seasonal Summaries
- Disclaimer
- Feedback

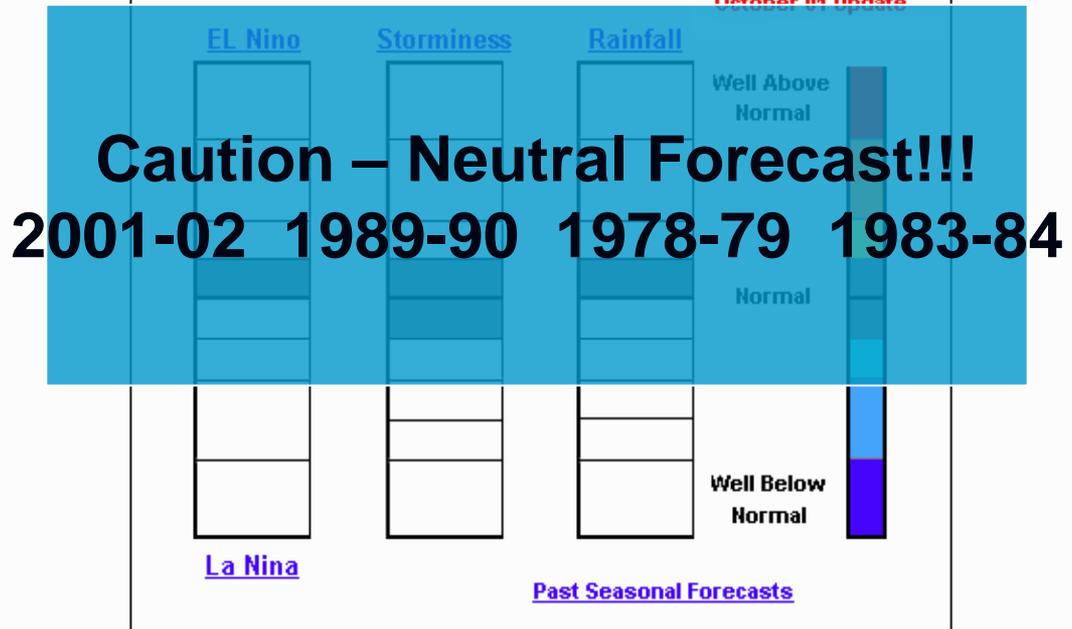
Florida EL Nino - Southern Oscillation (ENSO) Home Page

EXPERIMENTAL:

2003-2004 Experimental Dry Season Forecast for Florida
(Valid for period November 1st 2003 through April 30th 2004)

These pages contain experimental products that will be posted for evaluation through December 31st, 2003. During this period, we encourage your comments and suggestions for improvements using the survey available [here](#).

2003-2004 Experimental Florida Dry Season Forecast October 01 Update



Closing Remarks

- Significant Confidence in Predicting Departure from Normal of Florida Dry Season Storminess from Nino SST's - Especially During Extreme Phases.
- Nino 3.0 and 1+2 Outperform Nino 3.4 and 4.0 in Predicting Florida Storminess.
- Robustness of Simple ENSO Predictors.
- Investigate Ensemble MLR from CPC 16 Runs and add Probabilistic Forecast.



- Further Investigate Mechanisms Governing Intraseasonal Variability: NAO, PNA, MJO, etc.
 - Especially During Neutral Periods
- Work on Refining Storm Impact Climatology.
- Work Continues on Communicating Role of ENSO and other Teleconnections and their Impact on Florida (Website – Outreach)



Questions?

bart.hagemeyer@noaa.gov